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TRUSSUM POND, SUSSEX COUNTY, DELAWARE

Pacific Northwest Environmental Research Laboratory
Corvallis, Oregon

June 1975

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NATIONAL EUTROPHICATION SURVEY

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16. ABSTRACT

Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivided according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
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REPORT ON
TRUSSUM POND
SUSSEX COUNTY
DELAWARE
EPA REGION III
WORKING PAPER No. 241

WITH THE COOPERATION OF THE
DELAWARE DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL AND THE
DELAWARE NATIONAL GUARD

JUNE 1975

REPORT ON TRUSSUM POND

SUSSEX COUNTY, DELAWARE, EPA REGION III

by

National Eutrophication Survey

Water and Land Monitoring Branch
Monitoring Applications Laboratory
National Environmental Research Center
Las Vegas, Nevada

and

Eutrophication Survey Branch
Pacific Northwest Environmental Research Laboratory
National Environmental Research Center
Corvallis, Oregon

Working Paper No. 241

OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY

June 1975

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FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to freshwater lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point source discharge reduction and nonpoint source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin

planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's freshwater lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGMENTS

The staff of the National Eutrophication Survey (Office of Research and Development, U.S. Environmental Protection Agency) expresses sincere appreciation to the Delaware Department of Natural Resources and Environmental Control for professional involvement and to the Delaware National Guard for conducting the tributary sampling phase of the Survey.

Mr. N. C. Vasuki, Director, Division of Water Pollution Control, Department of Natural Resources and Environmental Control, provided invaluable lake documentation and counsel during the course of the Survey.

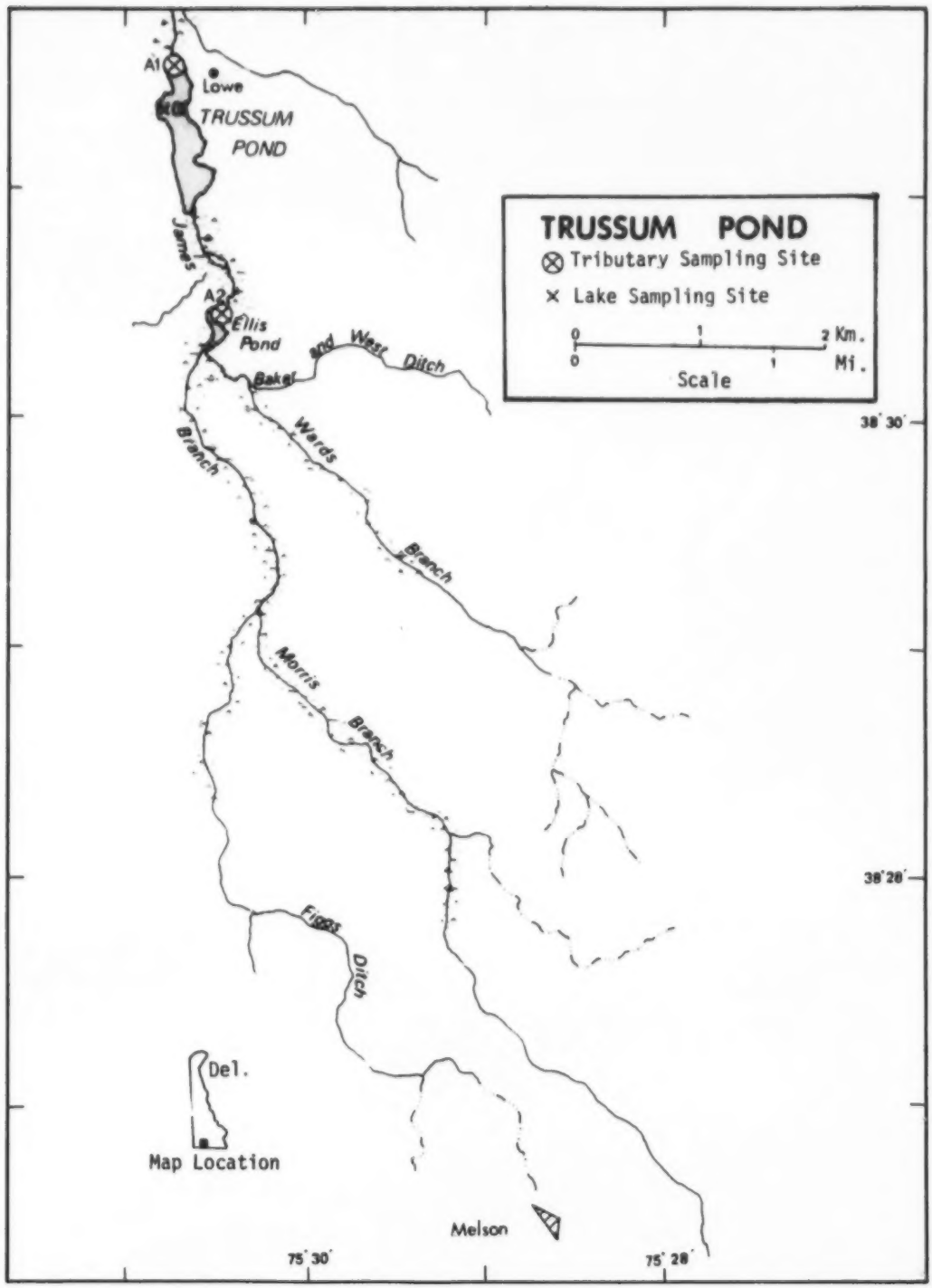
Major General Clarence E. Atkinson, the Adjutant General of Delaware, and Project Officer Colonel Donald S. Robinson, who directed the volunteer efforts of the Delaware National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY LAKES

STATE OF DELAWARE

LAKE NAME	COUNTY
Killen Pond	Kent
Moores Lake	Kent
Noxontown Pond	New Castle
Silver Lake	New Castle
Williams Pond	Sussex
Trussum Pond	Sussex


TRUSSUM POND
Tributary Sampling Site
Lake Sampling Site
0 1 2 Km.
0 1 Mi.
Scale
A1
Lowe
TRUSSUM POND
James
A2
Ellis Pond
and West Ditch
Baker
Branch
Wards
Branch
Morris
Branch
Figgs
Ditch
38°30'
38°28'
Del.
Map Location
Melson
75°30'
75°28'

TRUSSUM POND

STORET NO. 1010

I. CONCLUSIONS

A. Trophic Condition:

Trussum Pond is considered eutrophic based upon field observations and analysis of Survey data. Most of the pond is covered with cypress trees and higher aquatic plants. According to information provided by the State of Delaware, "fishing becomes difficult during the early summer because of large patches of floating heart, a pond lily. Spatterdock is gradually encroaching into the shallow areas adjacent to the shore. Bladderwart is very abundant in floating masses, disturbing access to some areas."

The water was characterized as humic in color with no visible algae.

Chlorophyll a levels ranged from a low of 3.8 micrograms/liter in the spring to 6.4 micrograms/liter in the summer. The algal assay control yield was 0.3 micrograms/liter. These moderate values are probably due to the utilization of nutrients by macrophytes.

B. Rate-Limiting Nutrient:

Algal assay results indicate that Trussum Pond was limited by available phosphorus levels. The ratios of available nitrogen to orthophosphorus in sampled waters substantiate phosphorus limitation.

C. Nutrient Controllability:

Nutrient loading to Trussum Pond slightly exceeds Vollenweider's (in press) "dangerous" (eutrophic) loading rate for phosphorus, and his "permissible" (oligotrophic) rate by two times for a lake of such mean depth and hydraulic retention time. However, Vollenweider's model probably does not apply to water bodies with short hydraulic retention times, and the mean hydraulic retention time for Trussum Pond is only 6 days.

There are no known point sources contributing to the nutrient budget of Trussum Pond. The James Branch (inlet of pond) contributes 90.8% of the phosphorus loading to the lake, and ungaged tributaries were estimated to have contributed 7.2%. A determination of surrounding land uses and unknown sources contributing loading is necessary before recommendations for lake improvement can be proposed.

II. LAKE AND DRAINAGE BASIN CHARACTERISTICS

Lake and drainage basin characteristics are itemized below. Trussum Pond's surface area was provided by the State of Delaware; mean depth was estimated based on survey data; tributary flow data were provided by the Delaware District Office of the U.S. Geological Survey (USGS)(outlet drainage area includes the lake surface area). Mean hydraulic retention time was obtained by dividing the lake volume by the mean flow of the outlet.

Precipitation values are estimated by methods as outlined in National Eutrophication Survey (NES) Working Paper No. 175. A table of metric/English conversions is included as Appendix A.

A. Lake Morphometry:

1. Surface area: 0.22 km^2.
2. Mean depth: 1.2 meters.
3. Maximum depth: 2.4 meters.
4. Volume: 0.264 x 10^6 m^3.
5. Mean hydraulic retention time: 6 days.

B. Tributary and Outlet (see Appendix C for flow data):

1. Tributaries -

Name	Drainage area(km^2)	Mean flow (m^3/sec)
A(2) James Branch	37.3	0.49
Minor tributaries & immediate drainage -	1.3	0.04
Totals	38.6	0.53
2. Outlet - A(1) James Branch	38.6	0.53

C. Precipitation:

1. Year of sampling: 105.0 centimeters.

2. Mean annual: 109.4 centimeters.

III. LAKE WATER QUALITY SUMMARY

Trussum Pond was sampled two times during the open-water season of 1973 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from one station on the pond and from one or more depths at that station (see map, page v). During each visit, depth-integrated samples were collected from Station 1 for chlorophyll a analysis and phytoplankton identification and enumeration. During the first visit, an 18.9-liter depth-integrated sample was composited for algal assays. Maximum depth sampled was 0.9 meters at Station 1. For a more detailed explanation of NES methods, see NES Working Paper No. 175.

The results obtained are presented in full in Appendix D and are summarized in III A for waters at the surface and at the maximum depth for each site. Results of the phytoplankton counts and chlorophyll a determinations are included in III B. Results of the limiting nutrient study are presented in III C.

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A. PHYSICAL AND CHEMICAL CHARACTERISTICS:

PARAMETER	(4/10/73) S*** = 1 N*	RANGE	MEDIAN	MAX DEPTH RANGE (METERS)	(7/28/73) S*** = 1 N*	RANGE	MEDIAN	MAX DEPTH RANGE (METERS)
TEMPERATURE (DEG CENT)								
0.-1.5 M DEPTH	2	13.0- 13.1	13.0	0.0- 0.9	1	28.7- 28.7	28.7	0.0- 0.0
MAX DEPTH**	1	13.0- 13.0	13.0	0.9- 0.9	1	28.7- 28.7	28.7	0.0- 0.0
DISSOLVED OXYGEN (MG/L)								
0.-1.5 M DEPTH	1	9.2- 9.2	9.2	0.9- 0.9	1	9.7- 9.7	9.7	0.0- 0.0
MAX DEPTH**	1	9.2- 9.2	9.2	0.9- 0.9	1	9.7- 9.7	9.7	0.0- 0.0
CONDUCTIVITY (UMHOS)								
0.-1.5 M DEPTH	2	70.- 70.	70.	0.0- 0.9	0	*****-*****	*****	*****-*****
MAX DEPTH**	1	70.- 70.	70.	0.9- 0.9	0	*****-*****	*****	*****-*****
PH (STANDARD UNITS)								
0.-1.5 M DEPTH	2	7.7- 8.2	7.9	0.0- 0.9	1	6.8- 6.8	6.8	0.0- 0.0
MAX DEPTH**	1	7.7- 7.7	7.7	0.9- 0.9	1	6.8- 6.8	6.8	0.0- 0.0
TOTAL ALKALINITY (MG/L)								
0.-1.5 M DEPTH	2	10.- 10.	10.	0.0- 0.9	1	14.- 14.	14.	0.0- 0.0
MAX DEPTH**	1	10.- 10.	10.	0.9- 0.9	1	14.- 14.	14.	0.0- 0.0
TOTAL P (MG/L)								
0.-1.5 M DEPTH	2	0.038-0.040	0.039	0.0- 0.9	1	0.022-0.022	0.022	0.0- 0.0
MAX DEPTH**	1	0.038-0.038	0.038	0.9- 0.9	1	0.022-0.022	0.022	0.0- 0.0
DISSOLVED ORTHO P (MG/L)								
0.-1.5 M DEPTH	2	0.011-0.013	0.012	0.0- 0.9	1	0.007-0.007	0.007	0.0- 0.0
MAX DEPTH**	1	0.011-0.011	0.011	0.9- 0.9	1	0.007-0.007	0.007	0.0- 0.0
NO2+NO3 (MG/L)								
0.-1.5 M DEPTH	2	1.200-1.200	1.200	0.0- 0.9	1	0.100-0.100	0.100	0.0- 0.0
MAX DEPTH**	1	1.200-1.200	1.200	0.9- 0.9	1	0.100-0.100	0.100	0.0- 0.0
AMMONIA (MG/L)								
0.-1.5 M DEPTH	2	0.080-0.090	0.085	0.0- 0.9	1	0.060-0.060	0.060	0.0- 0.0
MAX DEPTH**	1	0.080-0.080	0.080	0.9- 0.9	1	0.060-0.060	0.060	0.0- 0.0
KJELDAHL N (MG/L)								
0.-1.5 M DEPTH	2	0.600-0.600	0.600	0.0- 0.9	1	0.600-0.600	0.600	0.0- 0.0
MAX DEPTH**	1	0.600-0.600	0.600	0.9- 0.9	1	0.600-0.600	0.600	0.0- 0.0
SECCHI DISC (METERS)								
	1	0.9- 0.9	0.9		0	*****-*****	*****	

* N = NO. OF SAMPLES
** MAXIMUM DEPTH SAMPLED AT EACH SITE
*** S = NO. OF SITES SAMPLED ON THIS DATE

B. Biological Characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera		Algal Units per ml
04/10/73	1.	Flagellates	1,031
	2.	Lyngbya	42
	3.	Melosira	42
	4.	Fragilaria	36
	5.	Synedra	24
		Other genera	133
		Total	1,308
07/30/73	1.	Flagellates	361
	2.	Spondylosium	361
	3.	Cosmarium	258
	4.	Dinoflagellates	206
	5.	Centric diatom	77
		Other genera	312
		Total	1,575

2. Chlorophyll a -

Sampling Date	Station Number	Chlorophyll a (micrograms/liter)
04/10/73	1	3.8
07/20/73	1	6.4

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked -

Spike(mg/l)	Ortho P Conc.(mg/l)	Inorganic N Conc.(mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.008	0.60	0.3
0.05 P	0.058	0.60	19.0
0.05 P + 1.0 N	0.058	1.60	21.4
1.00 N	0.008	1.60	0.2

2. Discussion -

The control yield of the assay alga, Selenastrum capricornutum, indicates that the potential for primary production in Trussum Pond was moderately low at the time of sampling. Increased growth of the test alga in response to the addition of orthophosphorus, as well as the lack of response to the addition of nitrogen, indicates that the lake was phosphorus limited when sampled. Spikes with nitrogen and phosphorus simultaneously resulted in maximum yield.

The ratios of inorganic nitrogen to orthophosphorus in the field samples for spring and summer were 107:1 and 23:1, respectively, further indicating phosphorus limitation.

IV. NUTRIENT LOADINGS
(See Appendix E for data)

For the determination of nutrient loadings, the Delaware National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page v), except for the high runoff month of March when two samples were collected. Sampling was begun in April 1973 and was completed in March 1974.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the Delaware District Office of the USGS for the tributary sites nearest the lake.

In this report, nutrient loads for sampled tributaries were determined by using a modification of the USGS computer program for calculating stream loadings. Nutrient loads indicated for tributaries are those measured minus known point source loads, if any.

Nutrient loadings for unsampled "minor tributaries and immediate drainage" ("ZZ" of USGS) were estimated by using the mean annual concentrations in James Branch at Station A(2) and mean annual ZZ flow.

A. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	kg P/yr	% of total
a. Tributaries (nonpoint load) -		
A(2) James Branch	345	90.8
b. Minor tributaries & immediate drainage (nonpoint load) -	30	7.9
c. Known municipal STP's - None		
d. Septic tanks* -	<1	<0.1
e. Known industrial - None		
f. Direct precipitation** -	5	1.3
Totals	380	100.0

2. Output - A(1) James Branch 250

3. Net annual P accumulation 130

*Estimate based on 2 lakeside residences.
**Estimated (see NES Working Paper No. 175).

B. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

Source	kg N/yr	% of total
a. Tributaries (nonpoint load) -		
A(2) James Branch	33,780	92.2
b. Minor tributaries & immediate drainage (nonpoint load) -	2,620	7.2
c. Known municipal STP's - None		
d. Septic tanks* -	<1	<0.1
e. Known industrial - None		
f. Direct precipitation** -	240	0.6
Totals	36,640	100.0

2. Output - A(1) James Branch 27,560

3. Net annual N accumulation - 9,080

*Estimate based on 2 lakeside residences.
**Estimated (see NES Working Paper No. 175).

C. Mean Annual Nonpoint Nutrient Export by Subdrainage Area:

Tributary	kg P/km^2/yr	kg N/km^2/yr
A(1) James Branch	9	906

D. Yearly Loading Rates:

In the following table, the existing phosphorus loading rate is compared to those proposed by Vollenweider (in press). Essentially, his "dangerous" rate is the rate at which the receiving waters would become eutrophic or remain eutrophic; his "permissible" rate is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic rate would be considered one between "dangerous" and "permissible."

	Total Yearly Phosphorus Loading Rate (grams/m^2/year)
Estimated loading rate for Trussum Pond	1.73
Vollenweider's "dangerous" or eutrophic rate	0.82
Vollenweider's "permissible" or oligotrophic rate	1.65

V. LITERATURE REVIEWED

Lesser, Charles A. 1966. "Aquatic Vegetation Survey; Federal Aid in Fish Restoration." Project #F-21-R. Delaware Fish and Game Commission, Dover, Delaware.

U.S. Environmental Protection Agency. 1975. "National Eutrophication Survey Methods 1973-1976." Working Paper No. 175. NERC, Las Vegas, Nevada and PNERL, Corvallis, Oregon.

Vollenweider, Richard A. (in press). "Input-Output Models." Schweiz. Z. Hydrol.

VI. APPENDICES

APPENDIX A

CONVERSION FACTORS

CONVERSION FACTORS

Hectares x 2.471 = acres

Meters x 3.281 = feet

Cubic meters x 8.107×10^{-4} = acre feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 = cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

APPENDIX B

PARAMETRIC RANKINGS OF LAKES

SAMPLED BY NES IN 1973

STATE OF DELAWARE

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P
1002	KILLEN POND	0.170	1.610	479.333	116.200	12.000	0.042
1005	MOORES LAKE	0.245	2.400	472.667	81.267	4.700	0.071
1007	NOXONTOWN POND	0.160	0.530	478.833	37.600	10.400	0.016
1008	SILVER LAKE	0.227	4.750	465.667	26.700	13.000	0.096
1009	WILLIAMS POND	0.042	2.010	449.333	30.100	8.800	0.010
1010	TRUSSUM POND	0.038	1.280	464.000	5.100	5.800	0.011

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P
1002	KILLEN POND	40 (2)	60 (3)	0 (0)	0 (0)	20 (1)	40 (2)
1005	MOORES LAKE	0 (0)	20 (1)	40 (2)	20 (1)	100 (5)	20 (1)
1007	NOXONTOWN POND	60 (3)	100 (5)	20 (1)	40 (2)	40 (2)	60 (3)
1008	SILVER LAKE	20 (1)	0 (0)	60 (3)	80 (4)	0 (0)	0 (0)
1009	WILLIAMS POND	80 (4)	40 (2)	100 (5)	60 (3)	60 (3)	100 (5)
1010	TRUSSUM POND	100 (5)	80 (4)	80 (4)	100 (5)	80 (4)	80 (4)

APPENDIX C

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR DELAWARE 10/20/75

LAKE CODE 1010 TROSSUM POND

TOTAL DRAINAGE AREA OF LAKE(SQ MI) 14.90

TRIBUTARY	SUB-DRAINAGE AREA(SQ MI)	NORMALIZED FLOWS(CFS) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
1010A1	14.90	24.00	28.50	35.00	26.00	20.00	15.50	12.50	14.50	8.60	8.30	13.00	18.50	18.65
1010A2	14.40	23.50	26.00	32.00	24.50	18.00	14.50	12.00	13.50	8.00	7.80	12.00	17.00	17.36
1010ZZ	0.50	0.50	2.50	3.00	1.50	2.00	1.00	0.50	1.00	0.60	0.50	1.00	1.50	1.29

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 14.90
SUM OF SUB-DRAINAGE AREAS = 14.90

TOTAL FLOW IN = 224.40
TOTAL FLOW OUT = 224.40

MEAN MONTHLY FLOWS AND DAILY FLOWS(CFS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
1010A1	4	73	26.00	28	24.00				
	5	73	16.50	20	16.00				
	6	73	11.50	24	12.00				
	7	73	8.60	22	8.60				
	8	73	19.00	19	6.70				
	9	73	11.00	23	8.00				
	10	73	6.60	28	5.30				
	11	73	6.60	11	6.90				
	12	73	18.00	2	6.40				
	1	74	34.00	6	43.00				
	2	74	19.50	10	18.00	24	18.00		
	3	74	18.20	10	16.00	24	18.00		
1010A2	4	73	24.00	28	22.00				
	5	73	15.50	20	15.00				
	6	73	10.50	24	11.00				
	7	73	8.10	22	8.00				
	8	73	17.50	19	6.30				
	9	73	10.00	23	7.50				
	10	73	6.10	28	5.00				
	11	73	6.10	11	6.40				
	12	73	16.00	2	5.00				
	1	74	31.20	6	41.00				
	2	74	18.20	10	17.00	24	17.00		
	3	74	17.20	10	15.00	24	17.00		
1010ZZ	4	73	2.30	28	2.00				
	5	73	1.00	20	1.00				
	6	73	1.00	24	1.00				
	7	73	0.50	22	0.60				
	8	73	1.50	19	0.40				
	9	73	1.00	23	0.50				
	10	73	0.50	28	0.30				
	11	73	0.50	11	0.50				
	12	73	2.00	2	0.40				
	1	74	2.80	6	2.40				
	2	74	1.30	10	1.40	24	1.00		
	3	74	1.00	10	0.90	24	1.00		

20

APPENDIX D

PHYSICAL AND CHEMICAL DATA

STORET RETRIEVAL DATE 75/10/16

101001
38 31 22.0 075 30 48.0
TRUSSUM POND
10 DELAWARE

11EPALES
3

2111202
0004 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/04/10	13 30	0000	13.1		36	70	8.20	10K	0.090	0.600	1.200	0.013
	13 30	0003	13.0	9.2		70	7.70	10K	0.080	0.600	1.200	0.011
73/07/20	15 50	0000	28.7	9.7			6.80	14	0.060	0.600	0.100	0.007

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/04/10	13 30	0000	0.040	3.8
	13 30	0003	0.038	
73/07/20	15 50	0000	0.022	6.4

K VALUE KNOWN TO BE
LESS THAN INDICATED

APPENDIX E

TRIBUTARY DATA

STORET RETRIEVAL DATE 75/10/16

1010A1
38 31 30.0 075 31 00.0
JAMES BRANCH
10 7.5 LAUREL
O/TRUSSUM POND
BRDG 4 MI SE OF LAUREL DELL
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L. P	00665 PHOS-TOT MG/L P
73/04/28	12 50		1.040	0.580	0.080	0.007	0.015
73/05/20	11 30		0.900	0.580	0.036	0.005K	0.020
73/06/24	09 25		0.350	0.720	0.073	0.010	0.025
73/07/22	11 15		0.110	0.690	0.024	0.005K	0.015
73/08/19	10 00			1.980	0.066	0.011	0.025
73/09/23	13 30		0.550	0.480	0.044	0.008	0.015
73/10/28	10 20		0.460	0.750	0.026	0.005K	0.005K
73/11/11	14 45		0.440	0.750	0.063	0.008	0.010
73/12/02	09 30		0.580	0.300	0.052	0.005K	0.010
74/01/06	09 10		1.680	0.400	0.030	0.012	0.025
74/02/10	11 00		1.840	1.400	0.070	0.005K	0.005
74/02/24	10 00		1.700	0.500	0.045	0.010	0.015
74/03/10	09 15		1.340	0.500	0.060	0.010	0.010
74/03/24	09 20		1.180	0.700	0.080	0.005	0.025

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/10/16

1010A2
38 31 00.0 075 30 30.0
JAMES BRANCH
10 7.5 LAUREL
I/TRUSSUM POND
BRDG BELO POND 4.5 MI SE OF LAUREL DELL
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/28	13 05		1.120	0.860	0.026	0.010	0.025
73/05/20	11 45		1.320	0.380	0.105	0.013	0.030
73/06/24	10 00		0.960	0.580	0.058	0.019	0.035
73/07/22	11 55		0.512	1.400	0.190	0.035	0.145
73/08/19	10 45			1.760	0.046	0.015	0.035
73/09/23	14 30		0.980	2.900	0.110	0.010	0.025
73/10/28	11 00		0.880	1.200	0.042	0.007	0.015
73/11/11	15 15		0.965	0.550	0.031	0.007	0.020
73/12/02	10 00		0.940	0.250	0.032	0.008	0.015
74/01/06	10 00		2.000	0.450	0.028	0.012	0.025
74/02/10	11 30		2.100	0.500	0.040	0.010	0.025
74/02/24	09 15		1.760	0.500	0.025	0.005K	0.015
74/03/10	10 00		1.505	0.400	0.020	0.005	0.015
74/03/24	10 05		1.510	0.500	0.045	0.005	0.020

K VALUE KNOWN TO BE
LESS THAN INDICATED